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(54) Title: **USE OF ALLICIN AS PRESERVATIVE, AS DISINFECTANT, AS ANTIMICROBIAL OR AS BIOCIDAL AGENT**

(57) Abstract: The present invention provides the use of allicin in (i) the treatment of leishmaniasis; (ii) as a disinfectant or biocidal treatment of aquatic species; (iii) as an antimicrobial agent for animal feed; (iv) as a preservative agent in foodstuffs; (v) as a water disinfectant or biocide; (vi) as an antiparasitic treatment or antibacterial treatment for bees (apis); or (vii) in the preparation of a medicament for the treatment of Glycopeptide Intermediate Resistant *Staphylococcus Aureus*.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A23K1/17 A61K31/255 A23L3/3535 A01N59/02 A61P31/04 A61P31/10 A61P33/00 A61P33/02 C02F1/50		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 A23K A61K A23L A01N A61P C02F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the International search (name of data base and, where practical, search terms used) EPO-Internal, BIOSIS, CHEM ABS Data, EMBASE, WPI Data, PAJ, PASCAL, SCISEARCH, CANCERLIT		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ANKRI SERGE ET AL: "Antimicrobial properties of allicin from garlic" MICROBES AND INFECTION, vol. 1, no. 2, February 1999 (1999-02), pages 125-129, XP002289130 ISSN: 1286-4579	1-4
Y	page 126, column 2, line 1 - page 127, column 2, line 30 ----- -/--	16-20
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> Patent family members are listed in annex.		
* Special categories of cited documents : *A* document defining the general state of the art which is not considered to be of particular relevance *E* earlier document but published on or after the International filing date *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) *O* document referring to an oral disclosure, use, exhibition or other means *P* document published prior to the International filing date but later than the priority date claimed *T* later document published after the International filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. *&* document member of the same patent family		
Date of the actual completion of the International search		Date of mailing of the International search report
5 October 2004		17. 01. 2005
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Albrecht, S

INTERNATIONAL SEARCH REPORT

International Application No
.../GB2004/001408

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>MCCLURE C ET AL: "Effect of medicinal plant extracts on the growth of Leishmania sp. and mammalian cell lines"</p> <p>ABSTRACTS OF THE GENERAL MEETING OF THE AMERICAN SOCIETY FOR MICROBIOLOGY, vol. 94, no. 0, 1994, page 18, XP009033991 & 94TH GENERAL MEETING OF THE AMERICAN SOCIETY FOR MICROBIOLOGY; LAS VEGAS, NEVADA, USA; MAY 23-27, 1994</p> <p>ISSN: 1060-2011</p> <p>the whole document</p>	1-4
X	<p>MCCLURE, CHRISTOPHER D. ET AL:</p> <p>"Antileishmanial properties of Allium sativum extracts and derivatives"</p> <p>ACTA HORTICULTURAE , 426(INTERNATIONAL SYMPOSIUM ON MEDICINAL AND AROMATIC PLANTS, 1995), 183-191 CODEN: AHORA2; ISSN: 0567-7572, 1996, XP009034093</p> <p>page 185 - 186, chapter "Results" and "Discussion"</p> <p>figures 1,2</p>	1-4
X	<p>GHAZANFARI T ET AL: "Garlic induces a shift in cytokine pattern in Leishmania major-infected BALB/c mice"</p> <p>SCANDINAVIAN JOURNAL OF IMMUNOLOGY, vol. 52, no. 5, November 2000 (2000-11), pages 491-495, XP002289131</p> <p>ISSN: 0300-9475</p> <p>page 491, column 2, line 10 - line 20</p> <p>page 494, column 1, paragraph 3</p>	1-4
X	<p>LEDEZMA ELIADES ET AL: "Antiproliferative and leishmanicidal effect of ajoene on various Leishmania species: Ultrastructural study"</p> <p>PARASITOLOGY RESEARCH, vol. 88, no. 8, August 2002 (2002-08), pages 748-753, XP002289132</p> <p>ISSN: 0932-0113</p> <p>page 748, chapter "Introduction"</p> <p>page 751 - 752, chapter "Discussion"</p>	1-4
X	<p>AHMADI-RENANI K ET AL: "Effect of garlic extract on cutaneous leishmaniasis and the role of nitric oxide"</p> <p>IRANIAN JOURNAL OF MEDICAL SCIENCES 2002 IRAN, vol. 27, no. 3, 2002, pages 97-100, XP009034067</p> <p>ISSN: 0253-0716</p> <p>page 99, chapter "Discussion"</p>	1-4

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 99/27940 A (BARENHOLZ YECHZKEL ; YISSUM RES DEV CO (IL); GLICK DVORA (IL); KLAUS) 10 June 1999 (1999-06-10) page 3, line 22 - line 27 claims 12,28	1-4, 16-20
Y	WO 97/39115 A (MIRON TALIA ; MIRELMAN DAVID (IL); RABINKOV AHARON (IL); WILCHEK MEIR) 23 October 1997 (1997-10-23) cited in the application page 2, line 10 - line 12 page 2, line 25 - line 27 page 3, line 25 - line 28 page 7, line 16 - line 28	1-4, 16-20
X	US 5 906 825 A (CRAVER III WILLIAM E ET AL) 25 May 1999 (1999-05-25)	1,13-15
Y	column 5, line 37 - line 44 column 9, line 12 - line 20 column 11, line 18 - line 20 column 11, line 33 - line 42 column 11, line 59 column 13, line 12 - line 16 column 14, line 20	2-4, 16-20
Y	US 5 705 152 A (PLUMMER NIGEL) 6 January 1998 (1998-01-06)	1,16-20
A	column 1, line 11 - line 17 column 1, line 32 - line 42 column 2, line 46 - line 49 column 3, line 34 - line 39	2-4
X	WO 90/14012 A (FERRARI S N C DI CARLO E MARIO) 29 November 1990 (1990-11-29) page 1, line 1 - line 10 page 2, line 11 - line 19	1,16-20
X	DATABASE CHEMABS 'Online! CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; 11 September 1997 (1997-09-11), TIAN, XUEJUN: "Chemical inhibition of Ascophaera apis Olive & Spiltoir" XP002299152 retrieved from STN Database accession no. 1997:577673 the whole document & KUNCHONG ZHISHI , 34(3), 163-164 CODEN: KCCSAK; ISSN: 0452-8255, 1997,	1,16-20
	-/--	

INTERNATIONAL SEARCH REPORT

International Application No
.../GB2004/001408

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	SANDHU D K ET AL: "SENSITIVITY OF YEASTS ISOLATED FROM CASES OF VAGINITIS TO AQUEOUS EXTRACTS OF GARLIC" MYKOSEN, vol. 23, no. 12, 1980, pages 691-698, XP009037478 ISSN: 0027-5557 page 691-692, chapter "Introduction", paragraph 2 page 693; table 2 page 695, paragraph 3 page 696; table 4	1,16-20
Y	FARBMAN K S: "ANTIBACTERIAL ACTIVITY OF GARLIC AND ONIONS: A HISTORICAL PERSPECTIVE" PEDIATRIC INFECTIOUS DISEASE JOURNAL, WILLIAMS & WILKINS, BALTIMORE, MD, US, vol. 12, no. 7, 1 July 1993 (1993-07-01), pages 613-614, XP002051069 ISSN: 0891-3668	1,16-20
A	page 614, table 1 page 614, chapter "Discussion"	21
A	DATABASE BIOSIS 'Online!' BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US; 2001, CUTLER R R ET AL: "Activity of a novel, stable, Allicin extract, in liquid and cream formulations, against methicillin resistant Staphylococcus aureus (MRSA) including mupirocin resistant MRSA" XP002299153 Database accession no. PREV200200555330 abstract the whole document & ABSTRACTS OF THE INTERSCIENCE CONFERENCE ON ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, vol. 41, 2001, page 201, 41ST ANNUAL MEETING OF THE INTERSCIENCE CONFERENCE ON ANTIMICROBIAL AGENTS AND CHEMOTHERAPY; CHICAGO, ILLINOIS, USA; SEPTEMBER 22-25, 2001	1,21
P,X	WO 03/024437 A (BENNETT NORMAN JOHN ; JOSLING PETER DAVID (GB); STONE ISLAND HOLDINGS) 27 March 2003 (2003-03-27) cited in the application page 2, paragraph 7	1,21

INTERNATIONAL SEARCH REPORT

International application No.
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Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 1, 2, 16, 18, 19
because they relate to subject matter not required to be searched by this Authority, namely:
Although claims 1, 2, 16, 18, 19 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
1-4, 13-21 (1 in part)
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Although claims 1,2,16,18,19 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9927940	A	10-06-1999	AU 1350099 A WO 9927940 A1	16-06-1999 10-06-1999
WO 9739115	A	23-10-1997	AU 2305897 A CA 2251532 A1 EP 0904361 A1 WO 9739115 A1 IL 126596 A JP 2000508535 T US 6689588 B1	07-11-1997 23-10-1997 31-03-1999 23-10-1997 24-06-2003 11-07-2000 10-02-2004
US 5906825	A	25-05-1999	AU 1105199 A CA 2308588 A1 EP 1024796 A1 WO 9920258 A1	10-05-1999 29-04-1999 09-08-2000 29-04-1999
US 5705152	A	06-01-1998	AT 198279 T AU 650684 B2 AU 8752091 A CA 2093557 A1 DE 69132498 D1 DE 69132498 T2 EP 0554319 A1 WO 9207575 A1 IE 913766 A1 JP 6502154 T	15-01-2001 30-06-1994 26-05-1992 27-04-1992 01-02-2001 07-06-2001 11-08-1993 14-05-1992 22-05-1992 10-03-1994
WO 9014012	A	29-11-1990	IT 1232859 B AT 103770 T AU 5565890 A DE 69007931 D1 DE 69007931 T2 WO 9014012 A1 EP 0426802 A1 MC 2139 A PT 94073 A ,B US 5227162 A	05-03-1992 15-04-1994 18-12-1990 11-05-1994 15-09-1994 29-11-1990 15-05-1991 18-02-1992 08-01-1991 13-07-1993
WO 03024437	A	27-03-2003	EP 1435928 A1 WO 03024437 A1	14-07-2004 27-03-2003